Abstract of the Disclosure

A method is disclosed for depositing an optical quality silica film on a wafer by PECVD. The flows rates for a raw material gas, an oxidation gas, a carrier gas, and a dopant gas are first set at predetermined levels. The total deposition pressure is set at a predetermined level. The deposited film is then subjected to a post deposition heat treatment at a temperature selected to optimize the mechanical properties without affecting the optical properties. Finally, the observed FTIR characteristics of the deposited film are monitored to produce a film having the desired optical and mechanical properties. This technique permits the production of high quality optical films with reduced stress.